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AMENDED CLAIMS:

1. A method of producing blood products *in vitro*, in which

- a) non-SV40 transformed mesenchymal stem cells are isolated, which are CD34-negative, and which are negative for CD45 and positive for CD105, CD59, CD90, CD13, and MHC I after at least one passage in culture; and
- b) said isolated non-SV40 transformed mesenchymal stem cells are cultured with the following growth factors added individually or in combinations thereof:

stem cell factor (SCF), thrombopoietin (TPO), flt-3 ligand (FL), interleukins, including interleukin-3 (IL-3) and interleukin-6 (IL-6), granulocyte-colony stimulating factor (G-CSF), granulocyte-macrophage-colony stimulating factor (GM-CSF), erythropoietin (Epo), vascular-endothelial growth factor (VEGF), basic fibroblast growth factor (bFGF), hepatocyte growth factor (HGF), insulin-like growth factor (IGF), epidermal growth factor (EGF), leukaemia inhibitory factor (LIF), and hydrocortisone (HC),

for a time sufficient to produce at least one type of blood products.

- 2. The method of claim 1 wherein said at least one type of blood products comprises myeloid stem cells
- 3. The method of claim 1 wherein said at least one type of blood products comprises endothelial cells.

4. The method of claim 1 wherein said at least one type of blood products comprises lymphoid stem cells.
5. The method of claim 1 wherein said at least one type of blood products comprises dendritic cells.
6. The method of claim 1 wherein said at least one type of blood products comprises erythroid cells.
7. The method of claim 1 wherein said at least one type of blood products comprises megakaryocytes.
8. Use of a blood product obtained according to a method of any one of claims 1 to 7 for preparing a pharmaceutical composition for treating a patient in need of a blood product.
9. The use of claim 8 wherein said at least one type of blood products comprises myeloid stem cells.
10. The use of claim 8 wherein said at least one type of blood products comprises endothelial cells.
11. The use of claim 8 wherein said at least one type of blood products comprises lymphoid stem cells.
12. The use of claim 8 wherein said at least one type of blood products comprises dendritic cells
13. The use of claim 8 wherein said at least one type of blood products comprises erythroid cells.
14. The use of claim 8 wherein said at least one type of blood products comprises megakaryocytes

15. The use of claim 8, wherein the pharmaceutical composition is for treating patients suffering from leukemia, thrombocytopenia, leukopenia, granulocytopenia, lymphocytopenia, aplastic anemia, and/or autoimmune disease with or without bone marrow involvement, HIV patients, patients after chemotherapy, total body irradiation or irradiation of single parts of the body, patients with vascular, ischemic and/or malignant disease, or patients with cardiac ischemia.
16. The use of claim 8, wherein the the pharmaceutical composition is for treating patients suffering from anemia, leukopenia, thrombocytopenia and vascular diseases
17. The use of claim 16, wherein the anemia is due to acute leukemia, due to chronic leukemia, due to osteomyelofibrosis, due to aplastic anemia, due to thalassaemia, due to sickle cell disease, due to loss of blood, due to chemotherapy, due to medical drugs other than chemotherapy, due to radiation, and/or due to abuse of toxic compounds, wherein the leukopenia is due to acute leukemia, due to chronic leukemia, due to osteomyelofibrosis, due to aplastic anemia, due to thalassaemia, due to sickle cell disease, due to loss of blood, e.g. after an accident, due to chemotherapy, due to medical drugs other than chemotherapy, due to radiation, and/or due to abuse of toxic compounds, wherein the thrombocytopenia is due to acute leukemia, due to chronic leukemia, due to osteomyelofibrosis, due to aplastic anemia, due to thalassaemia, due to sickle cell disease, due to loss of blood, e.g. after an accident, due to chemotherapy, due to medical drugs other than chemotherapy, due to radiation, and/or due to abuse of toxic compounds.
18. The use of claim 16, wherein the vascular disease is autoimmune vasculitis, arterial occlusive disorders, venous occlusive disease, and/or arteriosclerosis, and for treating of patients suffering from ischemic diseases, such as coronary heart disease, stroke, acute renal failure, and/or claudicatio intermittens.

19. A method of differentiating non-SV40 transformed mesenchymal cells *in vitro*, in which
- a) non-SV40 transformed mesenchymal stem cells are isolated, which are CD34-negative, and which are negative for CD45 and positive for CD105, CD59, CD90, CD13, and MHC I after at least one passage in culture; and
 - b) said isolated non-SV40 transformed mesenchymal stem cells are cultured with the following growth factors added individually or in combinations thereof:

stem cell factor (SCF), thrombopoietin (TPO), flt-3 ligand (FL), interleukins, including interleukin-3 (IL-3) and interleukin-6 (IL-6), granulocyte-colony stimulating factor (G-CSF), granulocyte-macrophage-colony stimulating factor (GM-CSF), erythropoietin (Epo), vascular-endothelial growth factor (VEGF), basic fibroblast growth factor (bFGF), hepatocyte growth factor (HGF), insulin-like growth factor (IGF), epidermal growth factor (EGF), leukaemia inhibitory factor (LIF), and hydrocortisone (HC),

for a time sufficient to produce at least one type of blood products.
20. The method of claim 19 wherein said at least one type of blood products comprises myeloid stem cells.
21. The method of claim 19 wherein said at least one type of blood products comprises endothelial cells.
22. The method of claim 19 wherein said at least one type of blood products comprises lymphoid stem cells.

23. The method of claim 19 wherein said at least one type of blood products comprises dendritic cells.
24. The method of claim 19 wherein said at least one type of blood products comprises erythroid cells.
25. The method of claim 19 wherein said at least one type of blood products comprises megakaryocytes
26. Method for preparing a pharmaceutical composition comprising a blood product for treating a patient in need of said blood product, wherein said method comprises the method of any one of claims 1 to 7 for providing said blood product
27. The method of claim 26 wherein said at least one type of blood products comprises myeloid stem cells.
28. The method of claim 26 wherein said at least one type of blood products comprises endothelial cells.
29. The method of claim 26 wherein said at least one type of blood products comprises lymphoid stem cells.
30. The method of claim 26 wherein said at least one type of blood products comprises dendritic cells
31. The method of claim 26 wherein said at least one type of blood products comprises erythroid cells.
32. The method of claim 26 wherein said at least one type of blood products comprises megakaryocytes.

33. The method of claim 26, wherein the pharmaceutical composition is for treating patients suffering from leukemia, thrombocytopenia, leukopenia, granulocytopenia, lymphocytopenia, aplastic anemia, and/or autoimmune disease with or without bone marrow involvement, HIV patients, patients after chemotherapy, total body irradiation or irradiation of single parts of the body, patients with vascular, ischemic and/or malignant disease, or patients with cardiac ischemia.
34. The method of claim 26, wherein the the pharmaceutical composition is for treating patients suffering from anemia, leukopenia, thrombocytopenia and vascular diseases.
35. The method of claim 34, wherein the anemia is due to acute leukemia, due to chronic leukemia, due to osteomyelofibrosis, due to aplastic anemia, due to thalassaemia, due to sickle cell disease, due to loss of blood, due to chemotherapy, due to medical drugs other than chemotherapy, due to radiation, and/or due to abuse of toxic compounds, wherein the leukopenia is due to acute leukemia, due to chronic leukemia, due to osteomyelofibrosis, due to aplastic anemia, due to thalassaemia, due to sickle cell disease, due to loss of blood, e.g. after an accident, due to chemotherapy, due to medical drugs other than chemotherapy, due to radiation, and/or due to abuse of toxic compounds, wherein the thrombocytopenia is due to acute leukemia, due to chronic leukemia, due to osteomyelofibrosis, due to aplastic anemia, due to thalassaemia, due to sickle cell disease, due to loss of blood, e.g. after an accident, due to chemotherapy, due to medical drugs other than chemotherapy, due to radiation, and/or due to abuse of toxic compounds.
36. The method of claim 16, wherein the vascular disease is autoimmune vasculitis, arterial occlusive disorders, venous occlusive disease, and/or atherosclerosis, and for treating of patients suffering from ischemic diseases, such as coronary heart disease, stroke, acute renal failure, and/or claudication intermittens.

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